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dred. Thus each pair of spinnerets is calculated to produce a different kind or size of thread; contrary to the common belief that each thread is formed by a coalescence of silk from all, in which case the change from viscid to plain thread would depend in some obscure manner on the will of the animal. Nor do those drops of silk which are simultaneously produced coalesce into a homogeneous thread, as a web under a high power will show many of the threads frayed like a worn rope, and an unfortunate fly is not bound by the coils of a single thread but by a broad band of many detached threads, from the tips of the six spinnerets arranged in a line, thrown rapidly around it.

COARSE LINES ON DIATOMS.—Mr. F. Kitton, the valued correspondent of "Science-Gossip," again calls attention to the fact that while "smooth" diatoms have been patiently studied with lenses of high resolving power, those with coarse lines or costæ being easy of resolution have escaped such scrutiny, though many of them are possessed of finer markings which are capable of resolution by the means applied to more "difficult" diatoms. The costæ of some species of *Synedra* and *Cymbella* he has recently studied in this way, and found the rib-like lines composed of a series of beads, reminding him of peas in a well filled pod. He has not yet been similarly successful with the *Pinnularias*.

NOTES.

THE State Board of Education have presented to the Massachusetts Legislature an extended report relating to the proposed general survey of the state, a subject which was referred to the Board for report by the last legislature. This report makes prominent a number of important points bearing on the necessity of the proposed survey, and gives minute estimates of its cost, which are placed at the comparatively insignificant sum of \$25,000 a year for a period of fifteen years. The value of the survey to the people of the state is so very apparent that we have little fear but that the legislature will pass the bill, as soon as it comes before them, notwithstanding the economical wave that in its periodic course has again broken upon our land. Certainly, if we were blessed with a more thorough understanding of our resource, and worked in all departments with more knowledge of the laws of

nature, and did not so ignorantly interfere with laws which we cannot change, we should not so often be in that sad position, when we have to stop and ask, Why are we so poor when riches are under our feet? To this end, that we may know our resources, and not only take better advantage of them, but also through knowledge avoid mistakes, we hold that the thorough survey of the state will prove of lasting benefit, and long before it is finally completed show itself even a financial success.

The survey, as asked for by the original memorial of the American Academy and as endorsed by the State Board of education, is not designed to be simply topographical and geological, though the well known imperfections of all maps of the state show the importance of the former, while the almost total ignorance of our very peculiar geology, and the present excitement at Newburyport, over the discovery of lead and silver, certainly are proof of the importance of the latter topic. But not only are these departments contemplated, but that of biology as well, and here again can we cite the importance of the survey in a field where ignorance is so uniformly the rule that to be wise is considered foolish. Here are thousands of people in the state dependent on the success of their crops and their stock for support, and hundreds of thousands still more dependent on what their farms will bring them, and all, so nearly or entirely ignorant of nature's laws, that hardly an act is committed in the efforts of cultivation, that is not sowing the seeds of failure in the future. It is the bearing which the biological part of the survey will have on these practical and vital points of our daily life, that will in the end make it the most important branch of the survey, though the very ignorance which will be its work to supplant by knowledge, will be the cause of its being the least understood at first, and the hardest to make men realize the importance of providing for, by Legislation.

For our credit as a state ever ready to do that which is best for the people, and from the much higher principle, the advancement of knowledge among men, and the consequent higher degree of general education, we hope and trust that the important matter of a thorough and exhaustive survey in all departments, will not only be provided for by the present Legislature, but will be placed on so firm a basis that no matter what political revolutions may ensue during the next fifteen years, the provisions for the survey shall remain intact.

Three preliminary maps have during the past year been published by Hayden's U. S. Geological Survey of the Territories, the one of most interest being a preliminary map of Central Colorado showing the region surveyed in 1873.

A glance at the "Catalogue of the Publications of the U. S. Geological Survey of the Territories, F. V. Hayden, Geologist in charge, Washington, 1874," may give some idea of the energy shown in the conduct of this survey; several volumes appearing annually, beside smaller pamphlets, containing a large mass of information regarding the public lands. Exchanges of the publications of the survey with societies and individuals engaged in scientific studies are desired.

PROF. CH. FRED. HARTT, who left this country for Brazil by way of England in Oct. last with his assistant and photographer, Mr. John Branner of the Geological Laboratory, Cornell University, was busy on the surface geology of the neighborhood of Rio de Janeiro when last heard from. We believe he has found reasons to differ from Prof. T. Sterry Hunt's views in regard to the origin of the loose materials covering the rocks around Rio. He has been going over the ground with great care, working it up in detail, and we shall expect an interesting communication from him on the subject as soon as he returns.

SIR WILLIAM JARDINE died Nov. 12 at the age of seventy-four. Though especially devoted to ornithology, he established the "Magazine of Zoology and Botany," afterwards the "Annals of Natural History," which in 1841 was combined with the Magazine of Natural History to form the "Annals and Magazine of Natural History," now the leading English journal in this department of science.

VALUABLE sets of Floridan plants have been made by Dr. G. Palmer, and are authentically named and for sale at the herbarium of the Botanic Garden at Cambridge. They can be purchased on application to Prof. A. Gray, as Dr. P. is now in California.

MR. F. W. PUTNAM has received the appointment of Curator of the Peabody Museum of American Archæology and Ethnology at Cambridge, held by the late Professor Wyman.

THE GOVERNOR of Rhode Island has recommended, in his inaugural address, a geological survey of that state.